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SCRAP POLYETHYLENE FILM

RECYCLING FACILITY

OCTOBER 1993

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Ministry of
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SCRAP POLYETHYLENE FILM RECYCLING FACILITY

Report prepared by:

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Polyethics Recycling Industries Inc.

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ABSTRACT

The purpose of this project is to collect post consumer and post industrial scrap polyethylene film and densify this scrap by turning it into densified "repro" material. This material is then fed into an extruder to produce 100% recycled polyethylene film. The film would then be made into bags and re-sold to various customers for re-sale to the general public.

INTRODUCTION

Having had extensive experience in the polyethylene film industry and in particular in the recycling field, Tony Gulmen saw an opportunity to create an economically viable enterprise while at the same time diverting a substantial amount of plastic film from the solid waste stream.

Mr. Gulmen put together a sound business plan and identified an adequate supply of raw material from various sources including institutions, retailers, factories, municipalities, marinas, etc.

A proposal was made to the Ministry of the Environment to assist in financing the cost of the project totalling $525,000. A ministry grant of $108,160 was awarded based on eligible costs of $432,654 and this assistance provided the additional funding that was necessary to enable the project to be undertaken.

THE PROJECT

During the summer of 1991, the company Polyethics Recycling Industries Inc. was organized. The objective was to make film and bags from 100% recycled polyethylene. A suitable site was found to lease, and the following equipment was ordered:

One Marathon Blown Film System consisting of a 3.5" diameter extruder complete with screw, manual screen changer, 14" single layer die, single channel rotating die block, three zone control panel for die body, 10 HP air ring blower, heavy duty die cart, 125 HP drive panel.

The Cooling Tower for the extruder was installed by the owner of the building. Polyethics Recycling was responsible for all the steel work inside the tower. A three level steel tower was installed complete with stairs, railings, and a three foot catwalk at the first level for equipment support.

The 308 Scheldahl Bottom Seal Bag Machine was purchased used, complete with bottom seal

flying knife. A rebuilt Bell Mark in line mini printer was purchased for this machine with 56" dual nip winder for the printing press.

The 56" Solid Sideweld 308 Bag Machine was specially made for Polyethics Recycling with a 3 HP Reeves drive, and a 56" Corlin Folder with programmable logic controller and counter to manufacture one at a time dispensing bags.

A Densifier with a single platform and 2 1/2" x 12" cylinder drum and a 200HP 575 volt Lincoln motor was purchased for converting the raw material.

A Propane Powered Hyster Forklift was purchased along with a scale, pump cart, and motorized turntable for wrapping skids ready for shipment.

A 16.5" Audion Sealmaster was purchased with a timer, cutter, foot pedal stand, and rollofluxplatform for sealing outer bags for packaging in quantities of ten or twenty bags.

The owner of the building had a loading dock installed, and a tower for the extruder was built where the blown film rises and cools before being wound on rolls.

Following installation of the machinery, the employees were called in to begin work in the fall of 1991.

The process Polyethics would use to turn scrap polyethylene into bags to be purchased by consumers is as follows:

1) post consumer and post industrial polyethylene film is picked up or delivered to the plant by institutions, supermarkets, municipalities, individuals, factories, etc.

2) The post consumer and post industrial film is sorted when it comes into the plant and any contaminants removed. It is then fed into a densifying machine where it is chopped into a product resembling course meal called "repro".

3) The repro is fed into an extruder where it is heated to a temperature of approximately 400 degrees Fahrenheit. The material is a molten liquid at this temperature. The liquid is forced through a die to a desired gauge and blown into a bubble from 20" to 72" in diameter which rises approximately 35 feet into the tower. The

polyethylene cools as it rises. The air is squeezed out of the bubble on a collapsing frame near the top of the tower, the film is fed back down the tower and wound on rolls.

4) The roll film is then converted into bags on Polyethics bag making machines or sold to other converters to be made into bags.

5) The bags are then sold to consumers.

PROJECT ECONOMICS

After the machinery was in place the first priority was to establish a core of regular customers. The economy was slow last winter, the plastic bag industry was very competitive and a lot of hard work was needed to gain a share of the market.

Customers include distributors of wholesale paper and janitorial supplies in various centers around Ontario including Barrie, North Bay, Kingston, Mississauga, London, and Metropolitan Toronto.

Several newspapers buy their individual motor route and bundle bags from Polyethics.

Several converters who manufacture bags buy recycled film from Polyethics as well.

Carpet manufacturers buy clear film for wrapping the rolls of carpet, and some farmers purchase black film.

We are pleased to be able to supply garbage

bags to school boards in Ontario, local provincial parks, a local residence for the handicapped, nursing homes, and hospitals.

Sales figures increased gradually throughout the year. By the time summer came, Polyethics had a solid base of customers buying products, and the focus shifted to increasing productivity to meet orders with the machinery in the plant.

Making specialty bags to order has opened the door for us at several companies, and now those companies are buying garbage bags from us as well.

WASTE DIVERSION

Polyethics Recycling Industries Inc. is unique because we collect polyethylene scrap to recycle, densify the scrap, and convert it to a saleable product, film or bags, all under one roof.

We projected we would divert 1,400 tons of linear low density polyethylene per year in our project. From the following table it is apparent we came very close to our objective.

	Pounds Purchased	Pounds Sold
1st Quarter	507,449	484,469 pounds
2nd Quarter	609,130	561,257
3rd Quarter	479,718	598,843
4th Quarter	532,098	586,575
Total 1992	2,128,395	2,231,144 pounds

Most of the time we have a steady supply of raw material. We receive scrap from furniture retailers, couriers, factories, and institutions. In the spring several marinas brought us the shrink wrap from their boats as they unwrapped them for the new boating season. Our company was listed in a boating magazine as a place they could bring the

shrink wrap for recycling, and the response was very good.

Most of the scrap purchased comes from other manufacturers of poly film and bags. In June there was a shortage of natural resin, and some of these manufacturers began to keep their scrap, have it pelletized, and use it themselves.

Because the material we are processing is recycled material, it creates some areas of concern. Contaminants in the raw material can be a problem. Metal pieces can damage the machinery. Incompatible plastics such as polypropylene can cause problems at the densifier, or cause holes (fish eyes) in the film bubble blown at the extruder. Too much ink in the raw material will weaken the film as well.

In order to really make recycling work, the supplier of the scrap material and the recycler have to keep an open line of communication. The people who bring us their scrap on a regular basis bring us only linear low density polyethylene, which is the only type we can use. We stress the importance of removing contaminants such as tape,

string, stickers, etc. We also try to impress upon them the importance of keeping the product clean. If it has been left outside it will be too wet and dirty for us to use.

Ideally the perception at the source will change. Suppliers should feel responsible for the product they are bringing to us and be willing to work with the recycler to eliminate problems like contamination.

Some of our suppliers recycle because they are environmentally aware, some to avoid tipping fees at the landfill site. We also will purchase clean sorted scrap. We pay more for scrap which is ready to use and needs very little or no sorting. The price is higher for clear or white polyethylene than it is for coloured, mixed, or printed scrap.

Scrap polyethylene is bulky and there have been times when the space available in the plant has been filled to capacity. We have rented two trailers to alleviate the space problem.

Recycling plastic is a viable business economically. There is definitely a market for the

bags and film we produce, and the raw material to recycle is abundant, especially the mixed coloured material. 1992 has been a tough year for the manufacturing industry as a whole, and Polyethics Recycling is still a going concern at the end of its first year.

RESULTS & CONCLUSIONS

The original objective of this project was to collect post industrial and post-consumer polyethylene scrap, sort and recycle this polyethylene, densify it, feed it into an extruder to make film, and convert the film to bags for re-sale. The end product is made of 100% recycled material.

With the help of the Ministry of the Environment funding, our project has successfully completed its first year. More than 25 jobs have been created by this project.

PROBLEMS ENCOUNTERED AND POSSIBLE SOLUTIONS

Cooperation is necessary between the supplier of the raw material to be recycled, and the recycler, to maintain control of cleanliness and quality of the scrap. In the future we will insist on written contracts stating that if the product is unacceptable, it has to be returned at the supplier's expense. We are hoping a written contract will help to educate the supplier to control the cleanliness and content of the raw material because transportation is a major cost in recycling.

In the future, we would also consider pelletizing instead of densifying the material as this operation will screen some of the contaminants. Although we are aware of the higher initial capital cost involved with pelletizing, we are sure it will pay for itself in the long run.

Presently we are trying some bales from the curb side "Blue Box" collection from McLelland Disposal for the City of Orillia. We are still working on it.

We are very optimistic about prospects for recycling and recycled products, as we have proven

in the first year of operation that we have manufactured economically viable products from 100% recycled materials with post consumer content, and we are thankful to the Ministry of the Environment for supporting our idea and providing us with the grant.

POLYETHICS RECYCLING INDUSTRIES INC.

301 Forest Ave., P.O. Box 51, Orillia, Ontario L3V 6H9
Phone: (705) 329-2266 Fax: (705) 329-2252

Polyethics Recycling Industries Inc. are now receiving post-consumer and post-industrial scrap polyethylene, at 301 Forest Ave.

The plant is open from 8:00 a.m. to 4 p.m. Monday to Friday.

We accept soft plastics such as:

bread bags

milk bags - rinsed

frozen vegetable bags

insulation bags, no insulation

most grocery bags

dry cleaning bags

garment bags

sandwich bags, etc.

Bags to be kept separate because they are high density are from Zehrs, Canadian Tire, Zellers Shoppers Drug Mart, Sears, Consumers, etc.

All products should be **CLEAN**, free of all food products, plastic tabs, price stickers and hard plastic.

NO saran or cling wrap.

If you are not sure, please feel free to call Marlene at 329-2266.

TO AREA MARINAS

Re: PLASTIC BOAT COVERS

Spring is approaching quickly and it will soon be time to remove plastic boat covers.

Most plastic boat covers are made of a recyclable plastic. If each marina could encourage boat owners to follow some simple guidelines these covers could be reused or recycled. The following information should be shared with boat owners.

* Plastic covers should be reused when possible.

* If covers cannot be reused or repaired for reuse then they should be recycled.

* TO RECYCLE PLASTIC BOAT COVERS:

  - remove tabs, strings, tape, & labels
  - wipe both sides clean & dry
  - roll or fold the boat cover

AFTER YOUR PLASTIC BOAT COVERS HAVE BEEN PROPERLY CLEANED

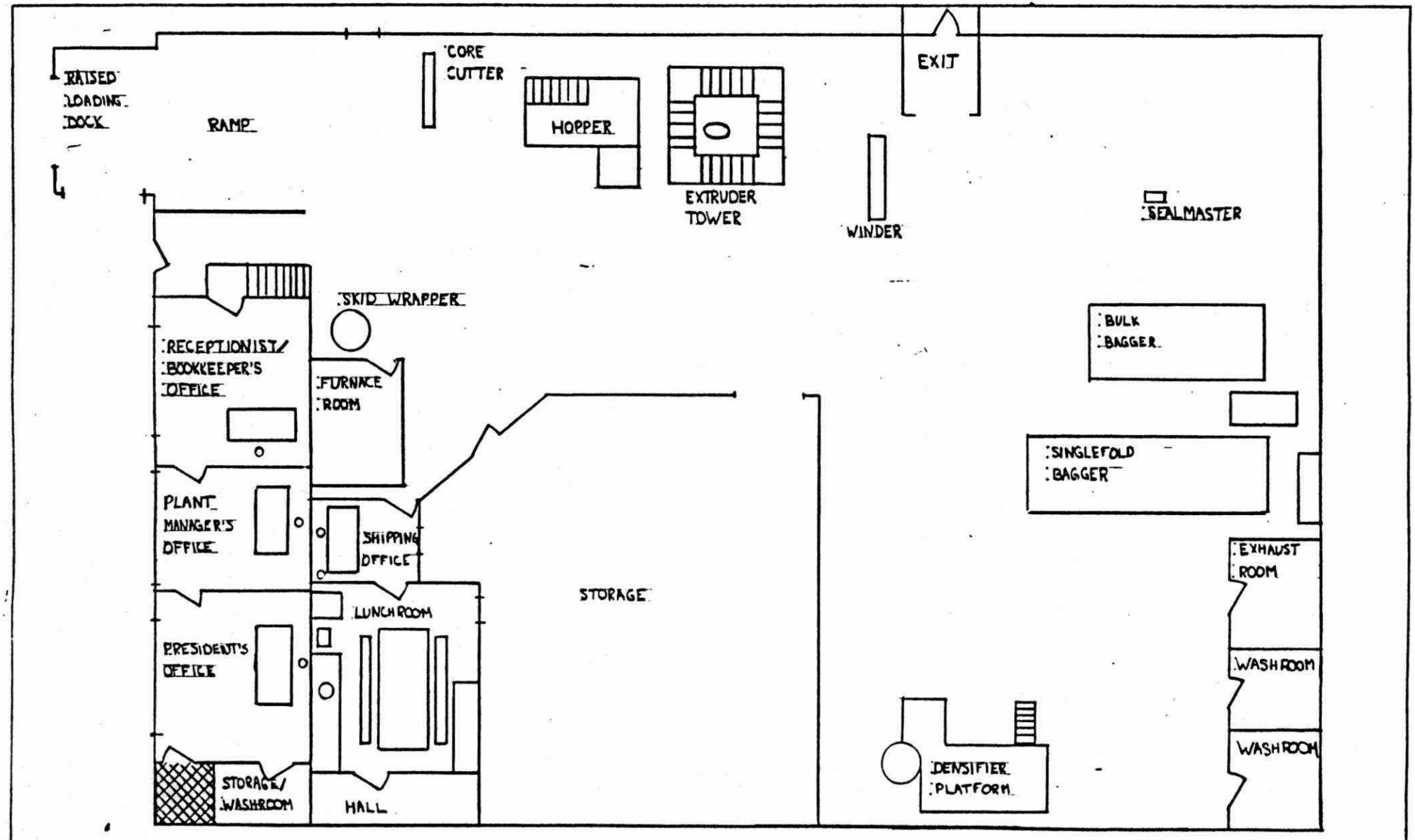
DELIVER TO: POLYETHICS
on Atherley Road (beside Uniplast & across from the Atherley Beer Store!)
(705) 327-2266 (Tony or Marlene)

Each Marina will offer a different service. Some may offer to transport these recyclable covers for a small fee, others may provide this service at no charge, and some Marinas may encourage each boat owner to be responsible for transporting their own plastic covers.

Boat covers are recyclable when they are free of the above mentioned contaminants (ie. tabs, strings, dirt, etc.). They should not be landfilled because there is a local alternative. By diverting this material from landfill it saves the Marinas which must pay high tipping fees, it saves this useful resource and it saves a great deal of space in our landfill! If everyone takes some time to do 'their part' the benefits are far reaching.

If you have any questions, ideas, or suggestions on how this program might work more effectively please contact 327-2141.

Thank you for sharing this information. Together we CAN make a difference!



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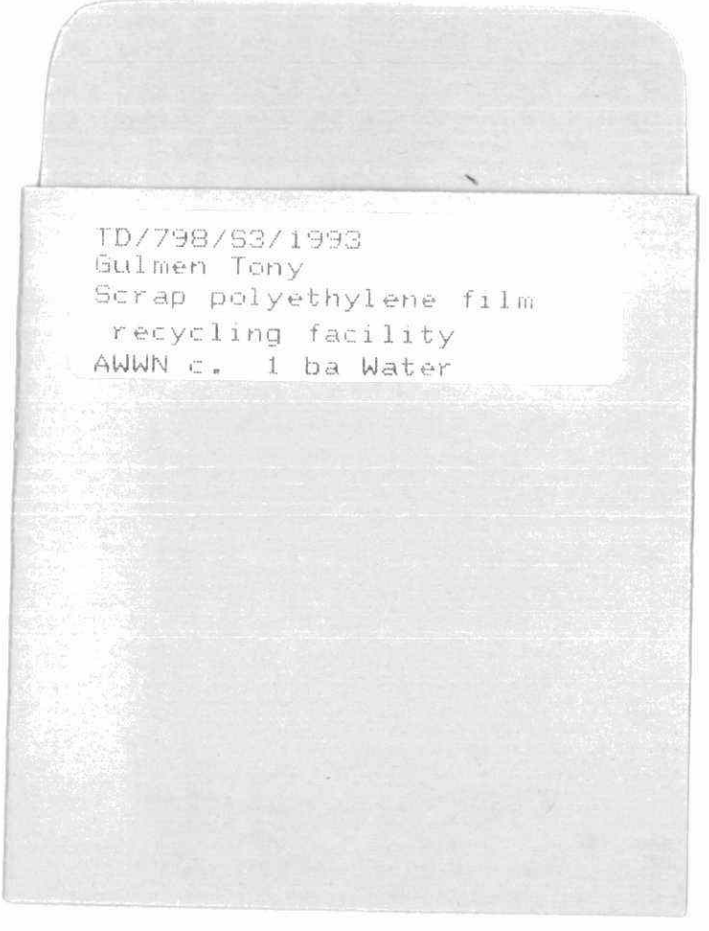

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